

Roll No.: ..

Total No. of Questions : 10] [Total No. of Printed Pages : 4

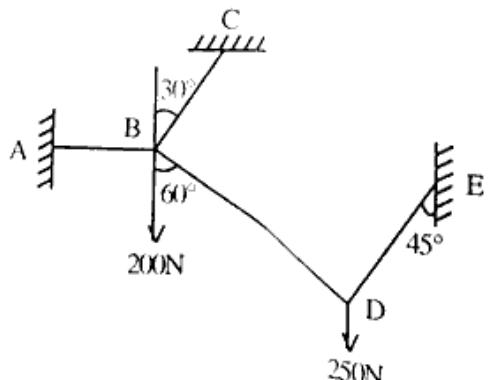
**EG-287**  
**B.E. II Semester (CGPA) Civil Engg.**  
**Examination 2018**  
**ENGINEERING MECHANICAL**  
**Paper : CE-204**

*Time Allowed : Three Hours]*

*[Maximum Marks : 60]*

**Note :** i) Attempt any five questions.  
 ii) All questions carry equal marks.

- Q.1.** a) Differentiate moment and couple. 4  
 b) A system of connected flexible cables shown in figure in supporting two vertical forces 200 N and 250 N at point B and D. Determine the forces in various segments of the cable. 8



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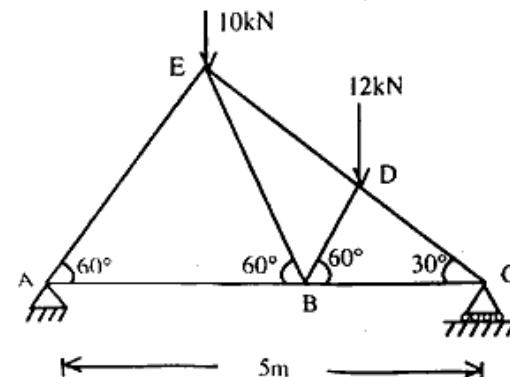
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*P.T.O.*

(2)

OR

- Q.2.** a) What is a truss? Explain the different types of truss. 4  
 b) Determine the forces in all the members of the truss loaded and supported as shown in figure below. 8



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- Q.3.** a) Define product of Inertia? 4  
 b) Derive the equation of polar moment of inertia for a circular section of diameter 'D'. 8

OR

- Q.4.** a) What do you mean by polar moment of inertia? 4

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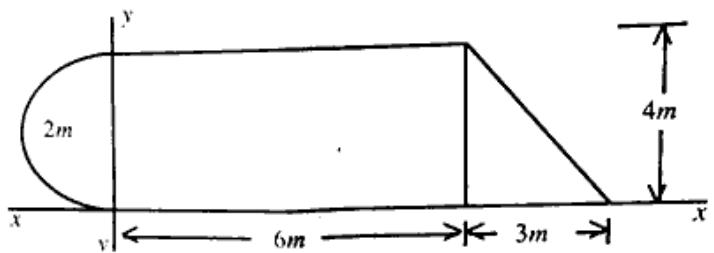
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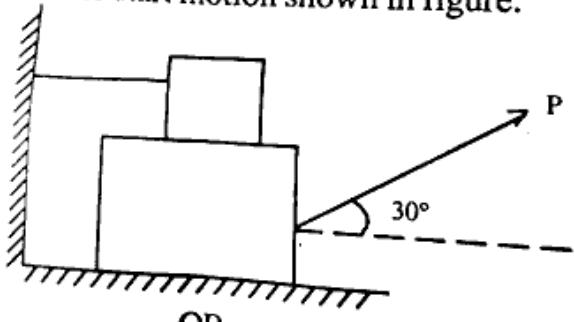
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- b) Determine the centroid of the area shown in figure with respect to axis shown in figure.

8



- Q.5. A block of weight 150 N rests on a block B of weight 250 N and tied with a string at D. Determine the pull, inclined at  $30^\circ$  to horizontal and applied to block B to start motion shown in figure. 12



OR

- Q.6. A rectangular block resting on a rough horizontal plane requires a pull of 18N inclined at  $30^\circ$  to the plane just remove it. It was found that a push of 22 N inclined at  $30^\circ$  to the plane just removed the body. Find out the weight of the body and the coefficient of friction.

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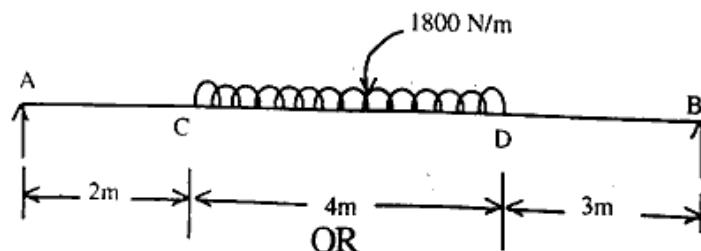
- Q.7. The maximum possible acceleration or deceleration that a train may have in 'a' while its maximum speed is 'v'. Find the shortest interval of time in which the train can get from one station to the next if the distance between the stations is 'S'. 12

OR

- Q.8. Write short notes on any four: 12

- Laws of friction
- D'Alembert's principle
- Polar moment of inertia
- Radius of gyration
- Flywheel

- Q.9. Draw the S.F. and B.M diagrams for the beam loaded as shown in Fig.5. 12



- Q.10. A simply supported beam AB of length 6 m is hinged at A and B. It is subjected to a clockwise couple of 25 kN/m at a distance of 2 m from the left end A. Draw SFD and BMD. 12



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